CDM기반

감염병 시대의 환자 정보관리와 빅데이터 전략

AJOU UNIVERSITY | OHDSI

Rae Woong Park MD, PhD
Ajou University School of Medicine South Korea

분산연구망 및 공통데이터모델 CDM (Common Data Model)

기술적문제

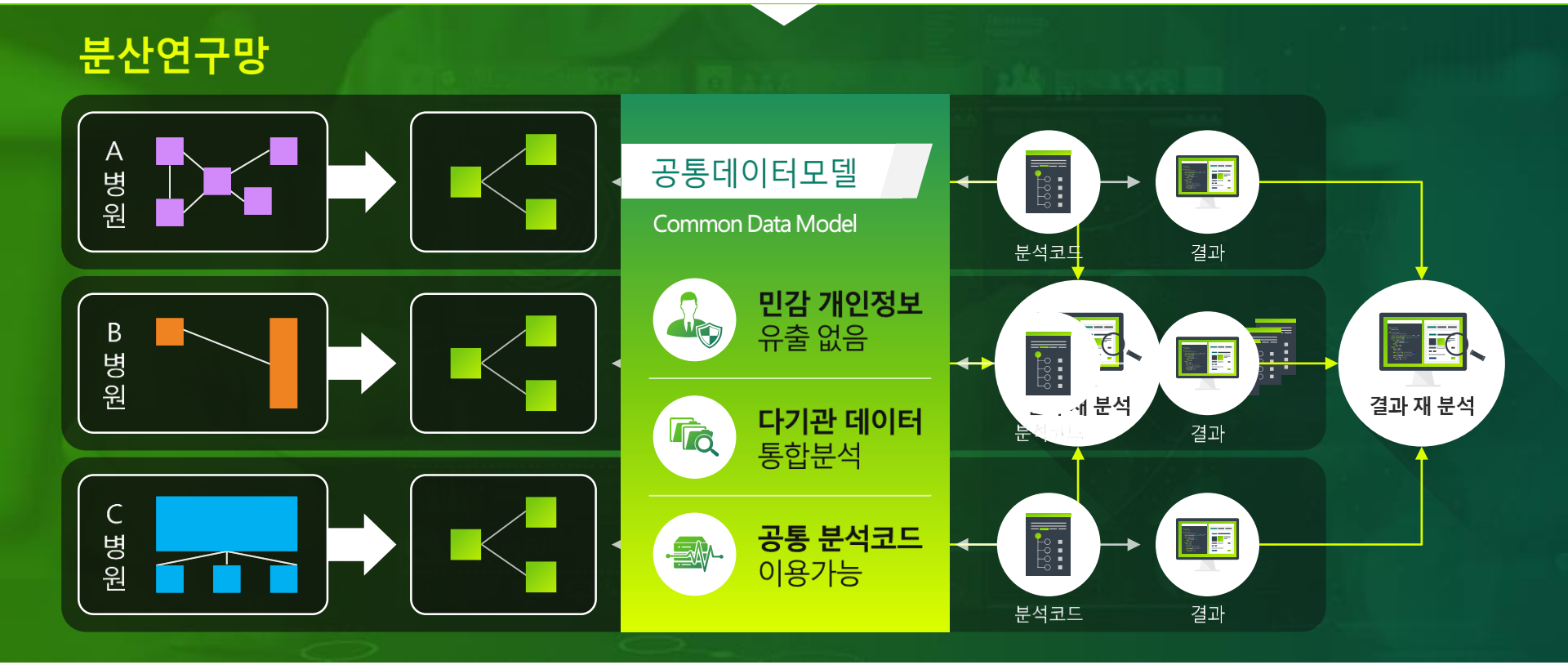
- 데이터 구조/형식의 **이질성**
- 데이터의 **질과 양**
- 기술적 **한계**

법적문제

- **개인정보보호법**
- 기관의 **허락**

인간본성/감정적문제

- 자신에게 **불리하게 사용될지 모른다는 두려움**
- 데이터 소유자는 자신의 자료를 **공유하고 싶어하지 않음**

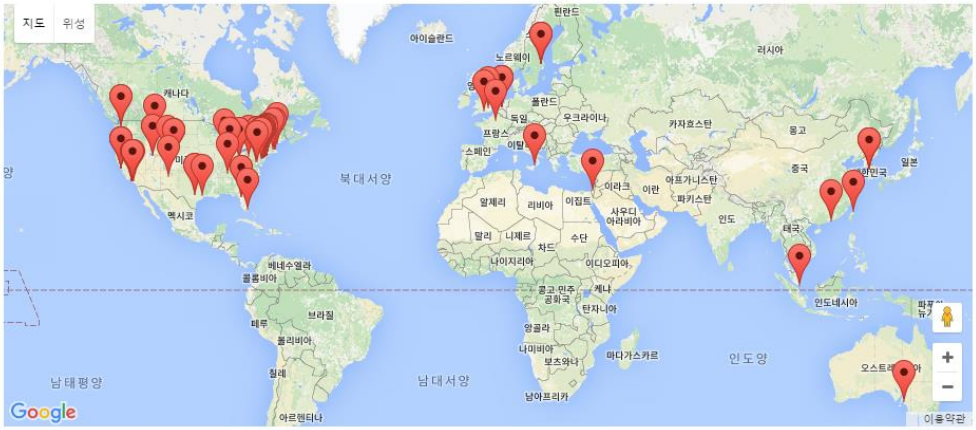


오딧세이, OHDSI, Observational Health Data Sciences and Informatics

www.ohdsi.org

- **비영리 국제 컨소시엄**
- OMOP 공통데이터모델을 기반으로 오픈소스툴을 개발하고 분산형 연구망 구축을 목표

Collaborators



- **Objectives**

  혁신성: 신선한 방법론적 접근을 적극적으로 찾고 장려
  재현성: 정확하고, 재현 가능하며, 잘 보정된 증거가 필요
  공동체 정신: 어떤 사람이라도 적극적 참여를 환영
  협력정신 : 실제적 필요를 우선적으로 다루기 위해서 공동으로 노력
  개방성: 우리 공동체가 만든 모든 성과를 공개
  선행의 정신: 우리는 고통 받는 환자를 비롯하여 참여자 및 참여기관의 권리를 보호하기 위해 노력

OHDSI

- OMOP의 모든 연구자들이 합류
- 전세계 200개 이상의 기관 참여

국제 표준화 플랫폼

- OMOP 공통데이터모델 기반
- 분산 연구망을 이용한 공동 연구 가능

OMOP 공통데이터모델 구축 현황

- 20 국가 / >150 데이터베이스
- 21억명 이상의 환자 데이터

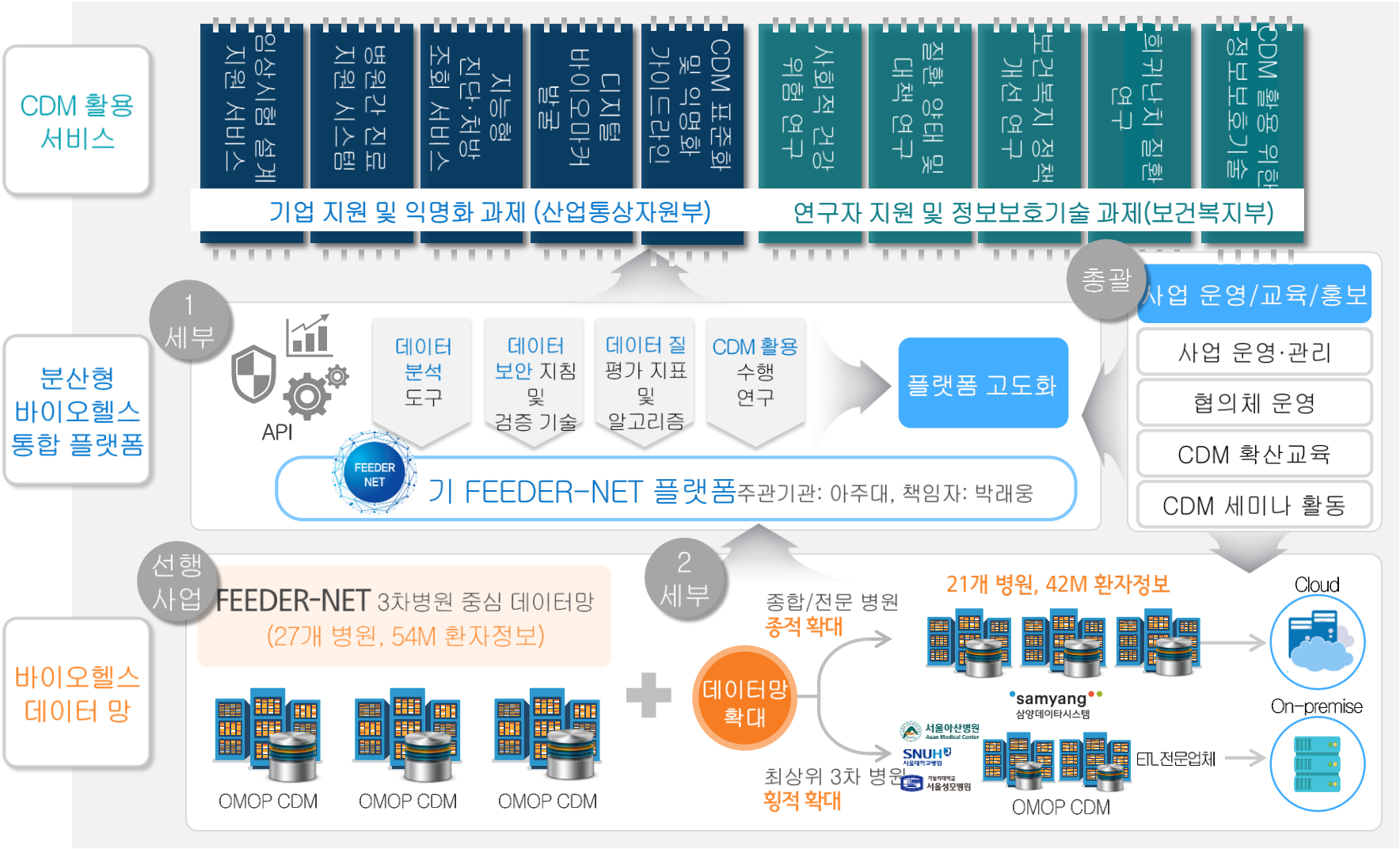
OHDSI 툴 개발 현황

- >140개 오픈소스 툴이 개발 완료 혹은 개발 진행 중

광범위한 개발자 커뮤니티

- **>3300명의 개발자**들이 >3000개의 주제에 대해 >22000번 토론 수행

산업통상자원부 – 복지부 CDM 사업 개요도



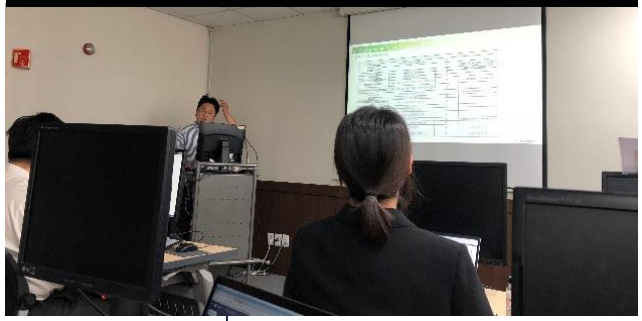
CDM 데이터망 구축

아주대학교 | KOHDSI

CDM 변환 절차

HW, SW 인프라 구축

CDM 구축 보고회



✓ CDM Base Data
✓ CDM conversion rule
✓ CDM Interface Job

사전 준비 → **인프라 구축** → **ETL 설계** → **ETL Job 개발** → **CDM 변환** → **데이터 검증**

✓ CDM 변환 절차 개요 공유
✓ CDM 대상 테이블 추출
✓ 인프라 구축 사전 검토

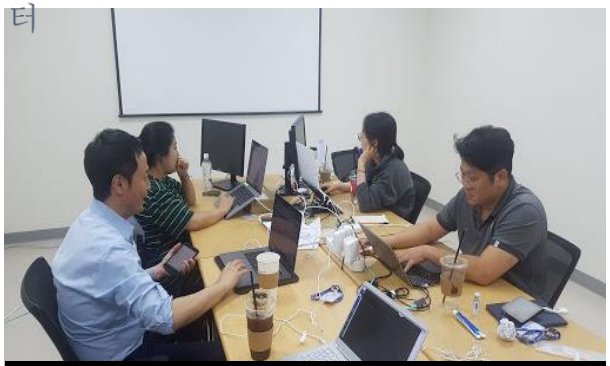
✓ EMR Source Data
✓ 용어 매핑 데이터 추출
✓ EMR ↔ CDM 인터페이스

✓ 10% 데이터 → 전체 데이터

✓ Achilles, Mapping
✓ Rule 검증

CDM 구축 세미나

CDM ETL 설계 작업



CDM 변환

FEEDER-NET Data Network in Korea

Data Network of 60+ Hospitals, 98M Patients

70% of Tertiary Teaching Hospitals

서울 Seoul

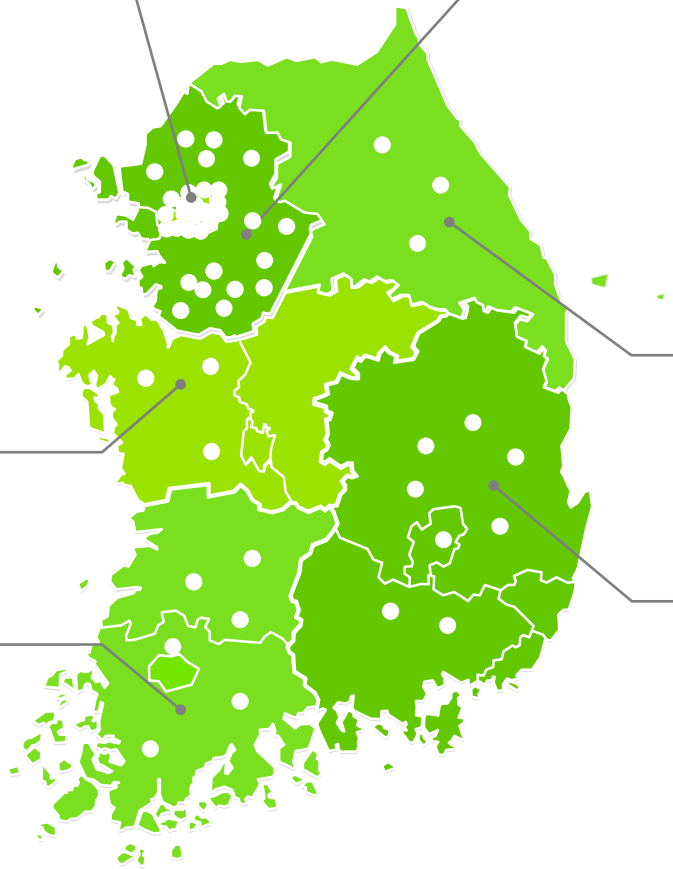
- 서울아산병원 Asan Medical Center
- SNUH 서울대학교병원
- 명지병원 MYONGJI HOSPITAL
- 가톨릭대학교 서울성모병원 THE CATHOLIC UNIV. OF KOREA SEOUL ST. MARY'S HOSPITAL
- 인제대학교서울백병원 INJE UNIVERSITY SEOUL PAIK HOSPITAL
- 가톨릭대학교 여의도성모병원 THE CATHOLIC UNIV. OF KOREA YEOUIDO ST. MARY'S HOSPITAL
- 한국원자력의학원
- 가톨릭대학교 성바오로병원 THE CATHOLIC UNIV. OF KOREA ST. PAUL'S HOSPITAL
- 세브란스병원 SEVERANCE HOSPITAL
- 고려대학교안암병원 KOREA UNIVERSITY ANSAN HOSPITAL
- 고려대학교구로병원
- 삼성서울병원
- 강동경희대학교병원
- 경희대학교병원
- 건국대학교병원
- 원자력병원
- 한양대학교의료원
- 보훈공단 중앙보훈병원
- 목동병원
- 강북삼성병원
- 한림대학교강동성심병원
- 순천향대학교 서울병원 SOON CHUN HYANG UNIVERSITY HOSPITAL SEOUL
- 연세대학교의과대학 강남세브란스병원

충청도 Chungcheongdo

- 건양대학교병원 KONYANG UNIV. HOSPITAL
- CNU 충남대학교병원
- 순천향대학교 천안병원 SOON CHUN HYANG UNIVERSITY HOSPITAL CHEONAN

전라도 Jeonlado

- 예수병원
- 원광대학교병원 WONKWANG UNIVERSITY HOSPITAL
- 전북대학교병원 CHONBUK NATIONAL UNIVERSITY HOSPITAL
- 전라북도 군산의료원
- 진안군의료원 JINANGUN MEDICAL CENTER
- 전라북도 남원의료원 Namwon Medical Center



Incheon / Kyeonggi 인천/경기

- 가톨릭대학교 부천성모병원
- 세종병원
- SNUH 분당서울대학교병원
- 가톨릭대학교 의정부성모병원
- 메디플렉스 세종병원
- 국립암센터 NATIONAL CANCER CENTER
- 인천사랑병원
- 순천향대학교 부천병원
- 인하대병원
- 아주대학교병원 Ajou University Hospital
- 고려대학교안산병원 KOREA UNIVERSITY ANSAN HOSPITAL
- 가천대길병원 Gachon University Gil Hospital
- 용인세브란스병원 YONGIN SEVERANCE HOSPITAL
- 동국대학교일산병원 dongguk university Ilsan hospital
- CHA 의과학대학교 차병원

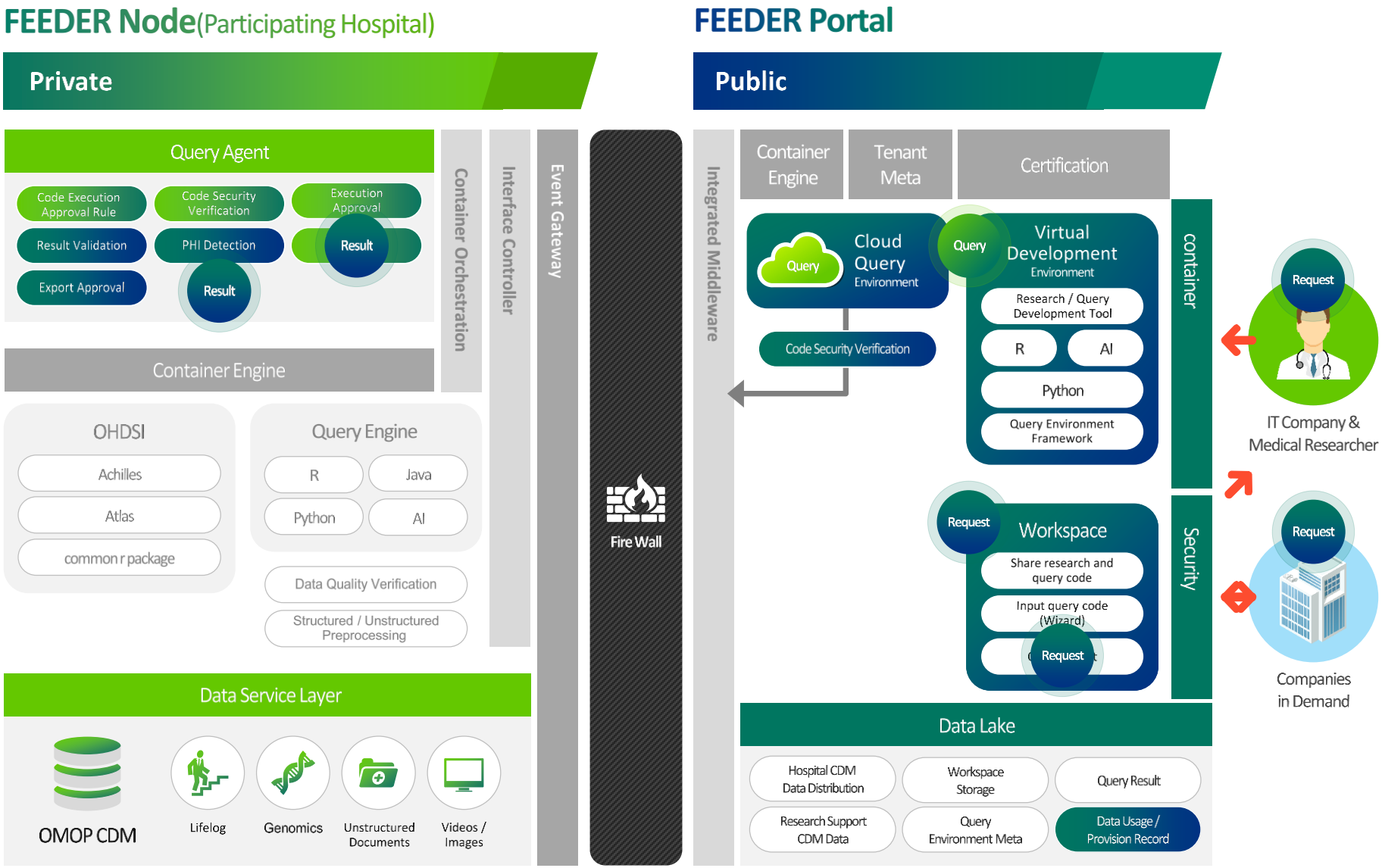
Gangwondo 강원도

- 가톨릭관동대학교 국제성모병원 INTL. ST. MARY'S HOSPITAL, CKU
- 원주세브란스기독병원 Wonju Severance Christian Hospital
- KNUH 강원대학교병원 Kangwon National University Hospital

Gyeongsangdo 경상도

- 울산대학교병원 ULSAN UNIVERSITY HOSPITAL
- 명지병원 MYONGJI HOSPITAL
- 순천향대학교 구미병원 SOON CHUN HYANG UNIVERSITY HOSPITAL GUMI
- KNUH 경북대학교병원
- PNU 부산대학교병원
- 동국대학교경주병원 dongguk university gyeongju hospital
- 칠곡경북대학교병원 KYUNGPOOK NATIONAL UNIVERSITY CHILGOK HOSPITAL
- 대구가톨릭대학교병원 DAEGU CATHOLIC UNIV. MEDICAL CENTER

How Distributed Research Platform works?



국내외 OMOP-CDM 활용 현황

산업통상자원부 | Keit 한국산업기술평가관리원 Korea Evaluation Institute of Industrial Technology | 아주대학교의료원 Ajou University Medical Center

국외

미국

FDA, NCI, NIH, eMERGE에서 OMOP-CDM을 표준모델로 채택

EU

EHDEN 프로젝트 출범 ('18. 11)
→ 향후 5년간 12개국 의료기관의 CDM 구축

- 22 hospitals/databases 194M person (96% EMR, 4% claims)
- +100M patient records by 2024

독일 덴마크

OMOP-CDM을 국가 헬스케어 데이터 백본으로 채택

국내

"범국가적 네트워크 확장 및 플랫폼 구축을 통한 글로벌 바이오헬스 빅데이터 주도권 확보"

산업통상자원부

「분산형 바이오헬스 통합 데이터망 구축 기술 개발」 사업 ('18 ~ '20)	+	「CDM기반 바이오헬스 통합 데이터망 기관확장 구축 기술개발」 사업 ('19 ~ '22)
상급종합병원 중심 바이오헬스 빅데이터망 구축		종합/전문병원으로의 바이오헬스 빅데이터망 확대

European OHDSI Symposium2020

27-29 March 2020 – Oxford, UK

Mathematical Institute, University of Oxford

NDORMS
NUFFIELD DEPARTMENT OF ORTHOPAEDICS, RHEUMATOLOGY AND MUSCULOSKELETAL SCIENCES

2020 Study-a-Thon

We are pleased to offer a Study-a-Thon during the 2020 OHDSI Symposium. The Study-a-Thon will take place on Tuesday, October 20 to Wednesday, October 21, at the Bethesda North Marriott Hotel & Conference Center.

Registration for the Study-a-Thon is separate from the main symposium. Study-a-Thon registration is scheduled to open in early July. Please revisit our website in July for further information.

No available data for Covid-19 infectees

아주대학교와 빌&멀린다 게이츠 재단의 협력

박래웅 교수, 빌&멀린다 게이츠 재단과 코로나19 공동 연구

곽성순 기자 승인 2020.04.20 12:18 최종 수정 2020.04.20 12:18 댓글 0

박 교수팀은 빌&멀린다 게이츠 재단 연구비를 받음으로써 코로나19 발생 이후 의료 데이터를 FeederNet으로 빠르게 변환해 전세계 커뮤니티가 이 감염과 관련된 특성 및 위험요소 뿐만 아니라 치료에 사용되는 여러 약물에 대한 효과와 부작용에 대해 이해하는데 도움을 줄 예정이다.

박 교수는 "전세계가 당면하고 있는 코로나19에 대한 이해와 지식을 높이고, 코로나19에 대한 실세계 근거를 생성함으로써 코로나19 해결책을 찾기 위한 전세계 연구자 간의 협력을 더욱 증진시킬 것으로 기대한다"고 밝혔다.

한편 박 교수는 산업통상자원부가 지원하는 대규모 국책사업, 분산형 바이오헬스 빅데이터 사업단장으로 국내 63여 개 의료기관의 임상 빅데이터를 표준화를 구축하고 있으며, 2013년 오딧세이(OHDSI) 창립 멤버로 현재까지 300회 이상의 국내외 강연 및 국제 연구에 참여하는 등 국제적으로 인정받고 있는 빅데이터 분야 전문가다.

오딧세이(OHDSI)는 비영리 국제 연구 컨소시엄으로 전세계 200개 이상의 기관이 이 연구에 참여하고 있으며, 공통데이터모델로 변환된 임상 데이터 건수가 전 세계적으로 20억 명분 이상에 달하고 있는 세계 유일한 다기관 연구 네트워크를 운영하고 있다.

BILL & MELINDA GATES foundation

GRANT AGREEMENT
Investment ID INV-016284

AGREEMENT SUMMARY & SIGNATURE PAGE

GRANTEE INFORMATION	
Name:	Ajou University Industry-Academic Cooperation Foundation
Tax Status:	[redacted]
Expenditure Responsibility:	
Mailing Address:	
Primary Contact:	

FOUNDATION INFORMA	
Mailing Address:	
Primary Contact:	

AGREEMENT INFORMAT	
Title:	
"Charitable Purpose":	
"Start Date":	
"End Date":	
This Agreement includes and incorporates by this reference:	

출처) 청년의사

Contributors

Data Providers

DCMC 대구가톨릭대학교병원 DAEGU CATHOLIC UNIV. MEDICAL CENTER

KNUH 칠곡경북대학교병원 KYUNGPOOK NATIONAL UNIVERSITY CHILGOK HOSPITAL

HIRA HEALTH INSURANCE REVIEW & ASSESSMENT SERVICE

CDM conversion,
Platform Service

evidnet

Organizer

FEEDER NET Federated E-Health Big Data for Evidence Renovation Network
분산형 바이오헬스 빅데이터 사업단
https://feedernet.com/

아주대학교의료원 Ajou University Medical Center

Permission for HIRA data release

Ministry of Health and Welfare

Funds for the FEEDER-NET

Ministry of Trade, Industry and Energy

OHDSI Study-a-Thon 에서의 플랫폼 활용

- **환자 현황**

	검사자	확진자	전체 사망자	확진 사망자
DCMC	1,270	**559**	13	1
KNUH_CG	519	**65**	35	2
HIRA	69,793	**5,483**	-	-

- **가입자 및 프로젝트 현황**
  - FeederNet은 OHDSI Study-a-Thon에서 발생된 연구들만 포함
  - HIRA는 청구데이터에 대한 분석도 포함

	가입자	프로젝트 수
FeederNet	-	36
HIRA	1399	303

출처) feedernet.com; hira-covid19.net

COVID-19에 대응하기 위한 FeederNet 플랫폼

DCMC 대구가톨릭대학교병원
DAEGU CATHOLIC UNIV. MEDICAL CENTER

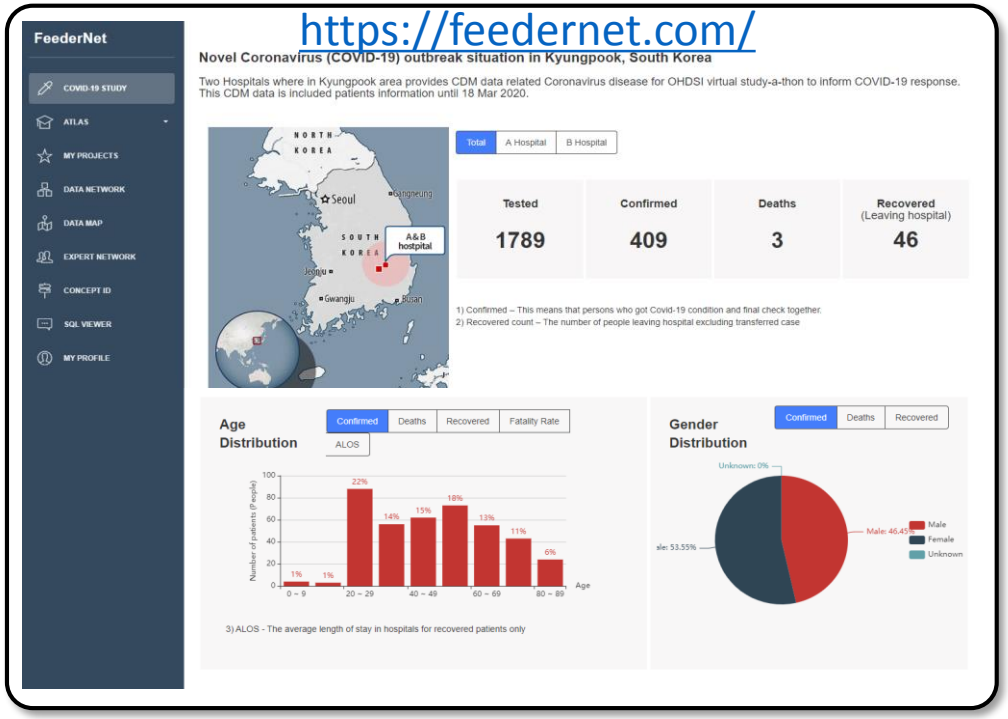
실제 **환자 데이터**는
병원 내에만 존재

KNUH 칠곡경북대학교병원
KYUNGPOOK NATIONAL UNIVERSITY CHILGOK HOSPITAL

실제 **환자 데이터**는
병원 내에만 존재

연구 분석 코드 ↑ ↓ **분석 결과**

https://feedernet.com/



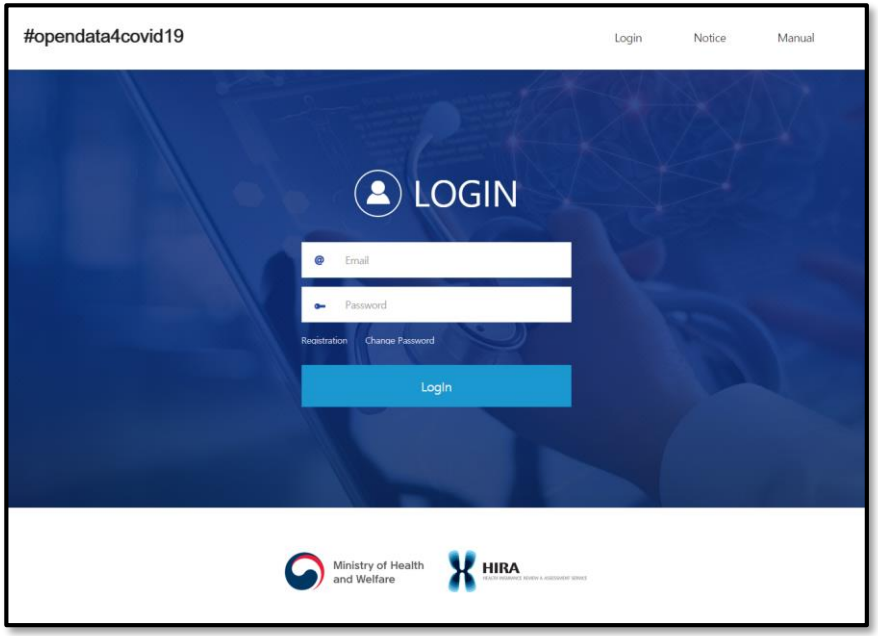
evidnet

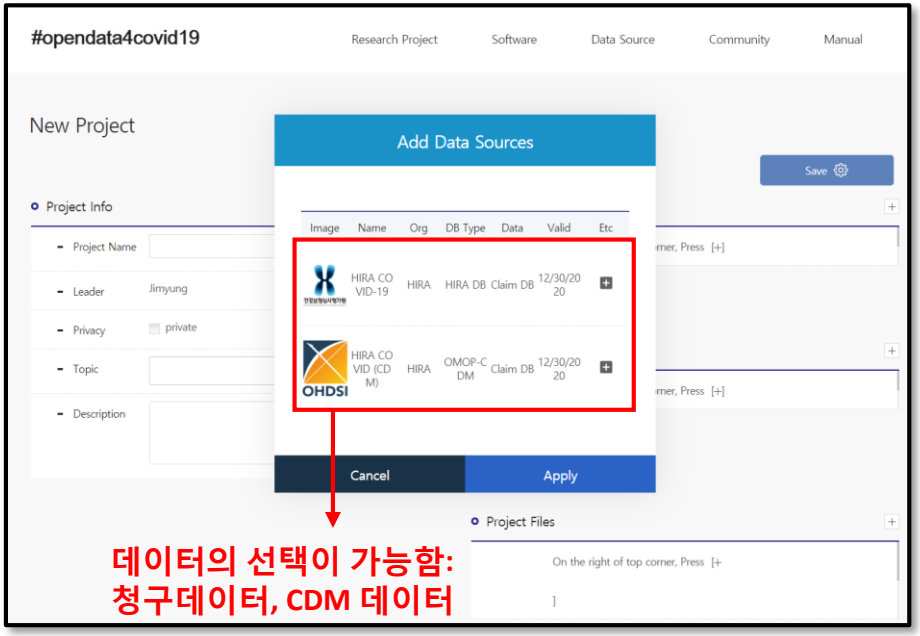
Ministry of Trade, Industry and Energy

출처) feedernet.com

COVID-19에 대응하기 위한 HIRA 플랫폼 (건강보험심사평가원)

https://hira-covid19.net/





데이터의 선택이 가능함:
청구데이터, CDM 데이터

기존 청구 자료 형식의 데이터

공통 데이터 모델 형식의 데이터

분석 결과

연구 분석 코드

COVID-19 연구자들

출처) hira-covid19.net

OHDSI Study-a-Thon

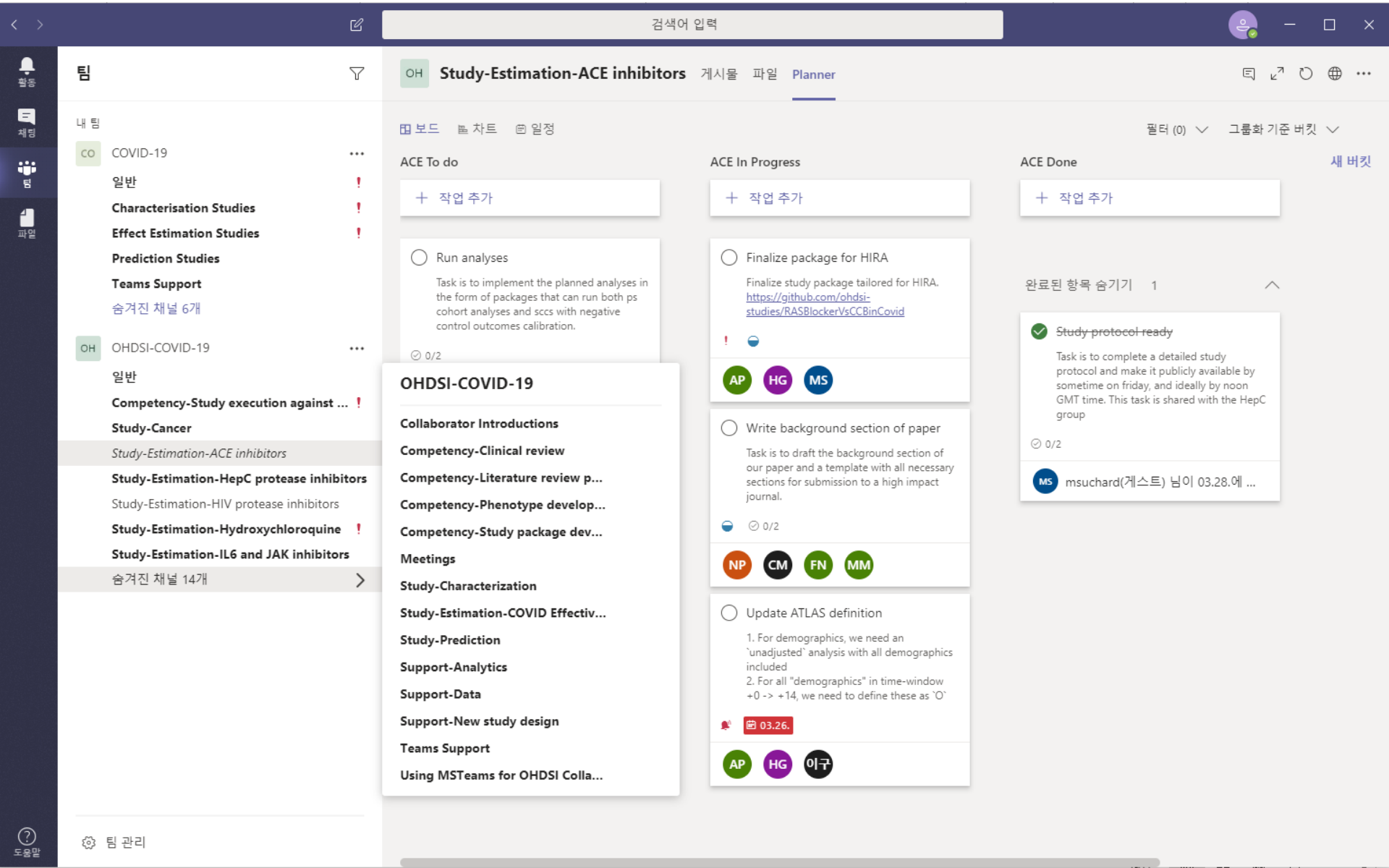
30여 개국의 **360여 명의 연구자**들이 참여하여 **88시간** 동안 연구 진행

출처) ohdsi.org

United Nations of OMOP (Our Global Network)

- 37 databases participating
  - Insurance claims, EHRs, Administrative data, Registries
  - 10 countries on 3 continents
- 8 databases with COVID+ patients (and growing)
- Everyone adopted OMOP CDMv5+

Collaborating Tool: Microsoft Teams



Study-a-thon Summary

What have we done?

In only **88** hours, we have:

- Convened **351** participants brought together from **30** countries
- Held **12** Global Huddles, **>100** collaborator calls, **>13,000** chat messages
- Engaged **15** concurrent channels
- Reviewed **>10,000** publications
- Drafted **9** protocols
- Released **13** study packages
- Designed **355** cohort definitions
- Assembled a distributed data network with **37** partners signed on to execute studies

https://www.ohdsi.org/covid-19-updates/

https://www.ohdsi.org/covid-19-updates/

OHDSI

OBSERVATIONAL HEALTH DATA SCIENCES AND INFORMATICS

COVID-19 Updates Page

The Observational Health Data Sciences and Informatics (OHDSI) international community hosted a COVID-19 virtual study-a-thon March 26-29 to inform healthcare decision-making in response to the current global pandemic.

MedRxiv Preprints: Hydroxychloroquine Study • Multi-Institution Characterization Study
Study-A-Thon Links: 88 Hours (Study-a-thon feature) • OHDSICOVID19 Closing Call

May 2

A few updates from this week.

• There has been some incredible work already from our phenotype team in advance of our new Characterization and Project Scylla studies. On Tuesday, we began discussion on creating cohorts for these projects, and we have identified a need for more than 150 phenotypes to support our characterization and estimation studies. We are working together to design and evaluate these cohorts. Thanks to everybody in the group for their dedicated work already. For anybody interested in joining this effort, please check out the "Competency-Phenotype development and evaluation" channel.

• Thank you to the community for your feedback to the Project Scylla protocol. Patrick Ryan and Daniel Prieto-Alhambra hope to have an updated version to share next week.

• While our hydroxychloroquine estimation study remains in peer review, the ACE inhibitor/ARBs estimation study is awaiting results from our international set of data partners, including the South Korean HIRA, SIDIAP (Spain), and several U.S. institutions

• The protocol for the IL6/biologics study is under review.

April 29

We are officially one month removed from the end of the #OHDSICOVID19 study-a-thon. Our community continues to build on studies generated from that terrific collaborative event, and we also look towards future studies to aid the COVID-19 response. Still, plenty has happened over the last month, and we wanted to highlight some of it here.

Two studies are currently in the peer-review process, but they have both been posted to MedRxiv. The estimation team completed an important study on the safety of hydroxychloroquine, alone and in combination with azithromycin, the largest study ever on the safety profile of a drug that generated significant attention as a potential COVID-19 therapy. Harlan Krumholz authored a blog post highlighting this study in Forbes.

The characterization team recently submitted the first multi-institution characterization of COVID-19 patients, which reported on the characteristics (demographics, prior conditions and medication use) of more than 6,800 COVID-positive patients from four databases. They were also compared to more than 52,000 patients hospitalized with influenza between 2014-19.

The study-a-thon itself, which was featured here, has many more studies in progress, including several that were discussed during the global closing call. There is an #OHDSICOVID19 YouTube playlist that includes each individual presentation from the global closing call, including studies focused on characterization, estimation and prediction.

Our work is being noticed outside of the OHDSI community. The EMA cited our hydroxychloroquine study in a recent post on the risks involved with HcQ and chloroquine, while both Science Magazine and MedPageToday.com.

Where will we be May 29? As mentioned in the April 28 post, there are exciting initiatives in early development on both characterization studies on

88 Hours: OHDSI's Signature Moment

The time was meant for highlighting OHDSI capabilities, not testing them.

The hours were meant for sharing global research, not sharing in global research.

The Observational Health Data Sciences and Informatics (OHDSI) community held a COVID-19 global, virtual study-a-thon March 26-29, believing that a network of people who valued both collaboration and open science could make a meaningful impact on the current global pandemic.

How? Nobody was quite sure in the moment, but they were confident they would figure it out.

"We chose an ambitious path and relied on our community and infrastructure to lead the way," said Patrick Ryan. "In simple terms, efforts within our community over the past 88 months set the foundation for OHDSI's most important and impactful 88 hours."

(Click here for the full feature story on the OHDSI COVID-19 study-a-thon)

April 15

The draft for our characterization study is in final review and we hope to submit for peer review by the end of the week. Thank you to Ed Burn for leading this effort and our entire characterization team for the collaborative work on this study.

This was the prioritized study for the characterization team. Once finished, there will be studies that build off this effort, including ones for hospital outcomes and condition occurrences.

The hydroxychloroquine study is currently in the peer-review process, and the preprint was posted on Friday. We are progressing on estimation studies focused on ACE inhibitors and HIV/HepC protease inhibitors. Similarly, the prediction team is advancing on four studies to assist decision-making efforts throughout the global healthcare community; cohorts have been validated for the prediction studies and entered into packages, and the protocols should have greater COVID data to leverage later this week.

We want to thank all of our data partners for their efforts in sharing their data and executing these studies to help generate reliable evidence at scale. The time and expertise that collaborators around the world share daily with OHDSI is a testament to your own dedication in the battle against the COVID-19 pandemic. Together, we are making a difference.

The OHDSI Twitter and LinkedIn feeds continue to replay individual presentations from the final global call; prediction studies have been the focus so far this week, with presentations from Peter Rijnbeek (Monday), Jenna Reps (Tuesday) and Ross Williams (Wednesday) posted so far.

April 10

The Observational Health Data Sciences and Informatics (OHDSI) collaboration released a preprint on preliminary findings from the largest study ever completed on the safety profile of hydroxychloroquine, a drug currently being evaluated as a potential treatment for COVID-19.

Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health related behavior and should not be reported in news media as established information.

The preprint is available here.

The combined short-term use of hydroxychloroquine and azithromycin resulted in nearly 60% higher rate of cardiovascular-related mortality (calHR 2.19; (1.22-3.94)) than the combined use of hydroxychloroquine and amoxicillin. While not as high, there was also an advanced risk for both chest pain/angina (calHR 1.15 (1.05-1.26)) and heart failure (calHR 1.22 (1.02-1.45)) when azithromycin was added to hydroxychloroquine treatment.

These findings were generated from an international database of more than 950,000 users of hydroxychloroquine, including approximately 320,000 who used it in combination with azithromycin.

The short-term effect of hydroxychloroquine as a treatment drug was not found to have an excess risk by itself when compared to sulfasalazine among a large set of patients (950,769 and 306,706, respectively) being treated for rheumatoid arthritis.

Patients from five different countries (Germany, Japan, Spain, the United State, and the United Kingdom) were included in this study, the first to be shared via preprint from a four-day OHDSI COVID-19 study-a-thon, which brought together a global community to design and execute observationa studies to generate real-world evidence and help inform the current global pandemic.

These are preliminary findings that are currently in the peer-review process. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information.

April 8

The first paper (Safety of hydroxychloroquine with azithromycin: a multi-national study) from our study-a-thon has been submitted for peer review to

Study Protocols and Analysis codes: https://github.com/ohdsi-studies/

Covid19HospitalizationCharacterization
Clinical Characterization of COVID-19

R 5 2 0 0 Updated 15 hours ago

Covid19EstimationRasInhibitors
Real-world, observational study to estimate the population-level effects of angiotensin converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARB) on coronavirus disease (COVID-19) incidence and complications

R 1 2 0 0 Updated 19 hours ago

MethodsLibraryPleEvaluation
R code used to evaluate the OHDSI Methods Library for population-level estimation

population-level-estimation methods-research

R 2 5 0 0 Updated 2 days ago

Covid19EstimationIl6JakInhibitors

R 0 0 0 0 Updated 2 days ago

DeadModel
A package for implementing the death imputation model on OMOP CDM data

death patient-level-prediction

R 0 1 1 0 Updated 4 days ago

COVID19CancerBaselineCharacterization
Future OHDSI network study to understand the baseline characteristics of cancer patients with COVID-19

1 1 0 0 Updated 5 days ago

Covid19PredictionStudies
Development and validation OHDSI network studies for the covid19 prediction topic

clinical-application patient-level-prediction covid-19

R 4 3 1 0 Updated 6 days ago

EhdenRaDmardsEstimation
Retrospective, real-world, observational study to estimate the population-level effects of conventional synthetic disease-modifying antirheumatic drugs among patients with rheumatoid arthritis. Designed and executed at the EHDEN Study-a-thon in Barcelona, January 2020.

R 2 2 0 0 Updated 11 days ago

Covid19CohortEvaluation
A central package for evaluation the cohorts used in the various Covid-19 studies

R 1 0 5 0 Updated 12 days ago

Covid19TestCharacterization
Characterization packages for COVID-19

R 1 0 0 0 Updated 16 days ago

Covid19EstimationHydroxychloroquine
Retrospective, real-world, observational study to estimate the population-level effects of hydroxychloroquine among patients with rheumatoid arthritis. Designed and executed during the OHDSI community COVID-19 virtual study-a-thon (March 26-29) to inform healthcare decision-making in response to the current global pandemic.

R 2 3 0 0 Updated 22 days ago

Study Results: https://data.ohdsi.org/

Index of /

- AhasHfBkleAmputation/
- AntihyperglycemicCessationPLP/
- BookOfOhdsiPlp/
- Covid19CharacterizationHospitalization/
- Covid19CohortEvaluationDmardsExposures/
- Covid19CohortEvaluationEfficacyOutcomes/
- Covid19CohortEvaluationExposures/
- Covid19CohortEvaluationSafetyOutcomes/
- Covid19EstimationAceInhibitors/
- Covid19EstimationHydroxychloroquine/
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- Covid19PredictingHospitalizationInFluPatients/
- Covid19PredictingHospitilizationAfterSentHome/
- Covid19PredictingSevereInHospResults/
- Covid19PredictingSimpleModels/
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- ehdenRaPrediction/
- HSModel/
- LegendBasicViewer/
- LegendMedCentral/
- MDDinBipolar/
- MethodEvalViewer/
- OhdsiEurope2019/
- OhdsiStudies/
- opioidExplorer/
- PatientLevelPredictionRepository/
- PhenotypeLibrarySubmit/
- PhenotypeLibraryViewer/
- plpLive18Study/

Study Results: https://data.ohdsi.org/

data.ohdsi.org/Covid19EstimationHydroxychloroquine/

Risk of hydroxychloroquine, alone and in combination with azithromycin: a multi-national study

About | Explore results

Target

Hydroxychloroquine with prior RA

Comparator

Sulfasalazine with prior RA

Outcome

All-cause mortality

Data source

- [x] AmbEMR
- [x] CCAE
- [x] Clinformatics
- [x] CPRD
- [x] DAGermany
- [x] IMRD
- [x] IPCI
- [x] JMDC
- [x] MDCD
- [x] MDCR
- [x] OpenClaims
- [x] OptumEHR
- [x] SIDIAP
- [x] VA
- [x] Meta-analysis

Show 15 entries

Analysis	Data source	I2	HR	LB	UB	P	Cal.HR	Cal.LB	Cal.UB	Cal.P
5 PS strata, 30 days follow-up	Clinformatics		0.41	0.19	0.97	0.04	0.45	0.20	1.04	0.07
5 PS strata, 30 days follow-up	CPRD		1.24	0.33	4.99	0.75	1.51	0.38	6.04	0.57
5 PS strata, 30 days follow-up	IMRD		0.41	0.06	1.93	0.32	0.63	0.10	3.80	0.63
5 PS strata, 30 days follow-up	IPCI		NA	NA	NA	NA	NA	NA	NA	NA
5 PS strata, 30 days follow-up	SIDIAP		NA	NA	NA	NA	NA	NA	NA	NA
5 PS strata, 30 days follow-up	VA		0.99	0.56	1.85	0.98	0.99	0.54	1.81	0.90
5 PS strata, 30 days follow-up	Meta-analysis	0.21	0.72	0.42	1.24	0.24	0.76	0.44	1.32	0.34

Showing 1 to 7 of 7 entries

Previous 1 Next

https://data.ohdsi.org/Covid19EstimationHydroxychloroquine/

Study Results: https://data.ohdsi.org/

Multiple PLP Viewer

- Description
- Summary
- Performance
- Model
- Log
- Help

Filters

Development Database: optumDod

Validation Database: All

Target Cohort: [COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18

Outcome Cohort: All

Time-at-risk start: All

Time-at-risk end: All

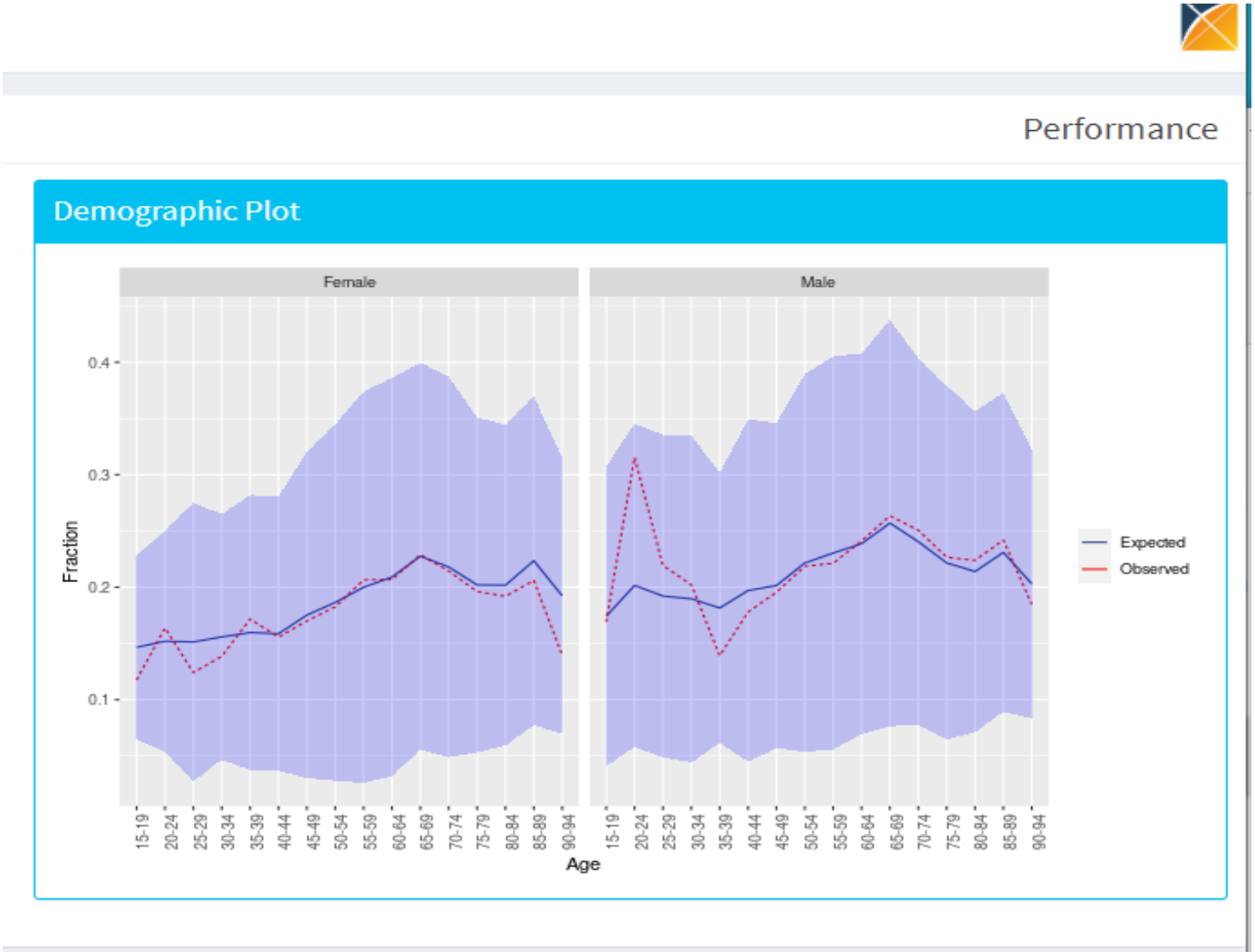
Model: All

Results | Model Settings | Population Settings | Covariate Settings

Show 10 entries Search:

Analysis	Dev	Val	T	O	Model	TAR start	TAR end	AUC	AUPRC	T Size	O Count	O Incidence (%)
Analysis_1	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.842	0.322	37499	8062	21.499
Analysis_2	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.72077	0.1743	37500	2783	7.42133
Analysis_3	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.538	0.236	37499	8062	21.499
Analysis_4	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.6305	0.1106	37499	2782	7.4189
Analysis_1	optumDod	ccae	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.668	0.279	631736	106724	16.894
Analysis_2	optumDod	ccae	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.762	0.142	631736	22531	3.567
Analysis_3	optumDod	ccae	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.551	0.191	631736	106724	16.894
Analysis_4	optumDod	ccae	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.5918	0.046	631736	22531	3.5665
Analysis_1	optumDod	jmdc	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.681	0.109	21544	1316	6.108
Analysis_2	optumDod	jmdc	[COVID19 ID29 V1] Hospitalizations with	[COVID19 ID28 v1] persons who die	Lasso Logistic	0	30	0.738	0.076	21544	538	2.497

Study Results: https://data.ohdsi.org/



OHDSI Study-a-Thon Results

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Safety of hydroxychloroquine, alone and in combination with azithromycin, in light of rapid wide-spread use for COVID-19: a multinational, network cohort and self-controlled case series study

Jennifer C.E Lane, James Weaver, Kristin Kostka, Talita Duarte-Salles, Maria Tereza F. Abrahao, Heba Alghoul, Osaid Alser, Thamir M Alshammari, Patricia Biedermann, Edward Burn, Paula Casajust, Mitch Conover, Aedin C. Culhane, Alexander Davydov, Scott L. DuVall, Dmitry Dymshyts, Sergio Fernández Bertolín, Kristina Fišter, Jill Hardin, Laura Hester, George Hripcsak, Seamus Kent, Sajan Khosla, Spyros Kolovos, Christophe G. Lambert, Johan ver der Lei, Ajit A. Londhe, Kristine E. Lynch, Rupa Makadia, Andrea V. Margulis, Michael E. Matheny, Paras Mehta, Daniel R. Morales, Henry Morgan-Stewart, Mees Mosseveld, Danielle Newby, Fredrik Nyberg, Anna Ostropolets, Rae Woong Park, Albert Prats-Uribe, Gowtham A. Rao, Christian Reich, Jenna Reps, Peter Rijnbeek, Selva Muthu Kumaran Sathappan, Martijn Schuemie, Sarah Seager, Anthony Sena, Azza Shoaibi, Matthew Spotnitz, Marc A. Suchard, Joel Swerdel, Carmen Olga Torre, David Vizcaya, Haini Wen, Marcel de Wilde, Seng Chan You, Lin Zhang, Oleg Zhuk, Patrick Ryan, Daniel Prieto-Alhambra

doi: https://doi.org/10.1101/2020.04.08.20054551

- 하이드록시클로로퀸과 아지트로마이신의 안정성 연구
- 독일, 일본, 네덜란드, 스페인, 영국, 미국의 데이터 사용
- 약 194만 명의 환자가 연구에 포함
- https://data.ohdsi.org/Covid19EstimationHydroxychloroquine/

출처) https://www.medrxiv.org/content/10.1101/2020.04.08.20054551v1

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An international characterisation of patients hospitalised with COVID-19 and a comparison with those previously hospitalised with influenza

Edward Burn, Seng Chan You, Anthony Sena, Kristin Kostka, Hamed Abedtash, Maria Tereza F. Abrahao, Amanda Alberga, Heba Alghoul, Osaid Alser, Thamir M Alshammari, Carlos Areia, Juan M Banda, Jaehyeong Cho, Aedin C Culhane, Alexander Davydov, Frank J DeFalco, Talita Duarte-Salles, Scott L DuVall, Thomas Falconer, Weihua Gao, Asieh Golozar, Jill Hardin, George Hripcsak, Vojtech Huser, Hokyun Jeon, Yonghua Jing, Chi Young Jung, Benjamin Skov Kaas-Hansen, Denys Kaduk, Seamus Kent, Yeesuk Kim, Spyros Kolovos, Jennifer Lane, Hyejin Lee, Kristine E. Lynch, Rupa Makadia, Michael E. Matheny, Paras Mehta, Daniel R. Morales, Karthik Natarajan, Fredrik Nyberg, Anna Ostropolets, Rae Woong Park, Jimyung Park, Jose D. Posada, Albert Prats-Uribe, Gowtham A. Rao, Christian Reich, Yeunsook Rho, Peter Rijnbeek, Selva Muthu Kumaran Sathappan, Lisa M. Schilling, Martijn Schuemie, Nigam H. Shah, Azza Shoaibi, Seokyoung Song, Matthew Spotnitz, Marc A. Suchard, Joel Swerdel, David Vizcaya, Salvatore Volpe, Haini Wen, Andrew E Williams, Belay B Yimer, Lin Zhang, Oleg Zhuk, Daniel Prieto-Alhambra, Patrick Ryan

doi: https://doi.org/10.1101/2020.04.22.20074336

- COVID-19 환자들의 임상적 특성 분석 연구
- 미국, 한국의 데이터 사용
- 6,806명의 환자가 연구에 포함 (한국: 5,172명)
- http://evidence.ohdsi.org:3838/Covid19CharacterizationHospitalization/

출처) https://www.medrxiv.org/content/10.1101/2020.04.22.20074336v1

진행 중인 OHDSI Study-a-Thon 프로젝트 목록 (I)

프로젝트	분석 종류	설명
COVID-19 in Pediatric	Characterization	COVID-19/Influenza 감염 소아 환자들의 임상 특성 연구
COVID-19 Testing Positive	Characterization	COVID-19/Influenza 검사에서 양성으로 나타나는 환자들의 임상 특성 연구
COVID-19 in Pregnancy	Characterization	COVID-19/Influenza 감염된 임산부들의 임상 특성 연구
COVID-19 HIV/Immunology	Characterization	COVID-19/Influenza 감염된 HIV 환자들의 임상 특성 및 면역 변화 연구
COVID-19 in Cancer	Characterization	COVID-19/Influenza 감염 암 환자들의 임상 특성 및 치료패턴 연구
COVID-19 in Hypertension	Characterization	COVID-19/Influenza 감염 고혈압 환자들의 임상 특성 연구

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진행 중인 OHDSI Study-a-Thon 프로젝트 목록 (II)

프로젝트	분석 종류	설명
Hospitalization Prediction of Patients (1)	Prediction	처음 병원에 방문한 환자들의 폐렴 입원 예측 모델
Hospitalization Prediction of Patients (2) – Outpatient	Prediction	외래 환자의 한달 이내 폐렴 입원 예측 모델
Severe Pneumonia Prediction	Prediction	폐렴 입원 환자의 중증도 예측 모델
Survival Prediction of ICU patients	Prediction	ICU 입원한 폐렴 환자들의 생존 예측 모델
Validation of COVID-19 Vulnerability Index	Prediction	기존 발표된 COVID-19 치명도 점수의 실제 COVID-19 환자 데이터를 활용한 검증

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진행 중인 OHDSI Study-a-Thon 프로젝트 목록 (III)

프로젝트	분석 종류	설명
Comparative Study of ACEi and ARB (1)	Estimation	COVID-19/Influenza 감염 환자들의 고혈압 약제에 따른 사망 및 합병증 비교 연구
Comparative Study of ACEi and ARB (2)	Estimation	COVID-19/Influenza 감염 환자들의 고혈압 약제에 따른 감염 위험도 비교 연구
Comparative Study of NSAIDs (1)	Estimation	COVID19/Influenza 감염 환자들의 Ibuprofen 사용에 따른 사망 및 합병증 비교 연구
Comparative Study of NSAIDs (2)	Estimation	COVID19/Influenza 감염 환자들의 Ibuprofen 사용에 따른 감염 위험도 비교 연구
SARS-Cov2-Large-scale Longitudinal Analysis (SCYLLA)	Estimation	COVID19/Influenza 감염 환자들에 사용되는 약물들의 안전성 및 효과 비교 연구

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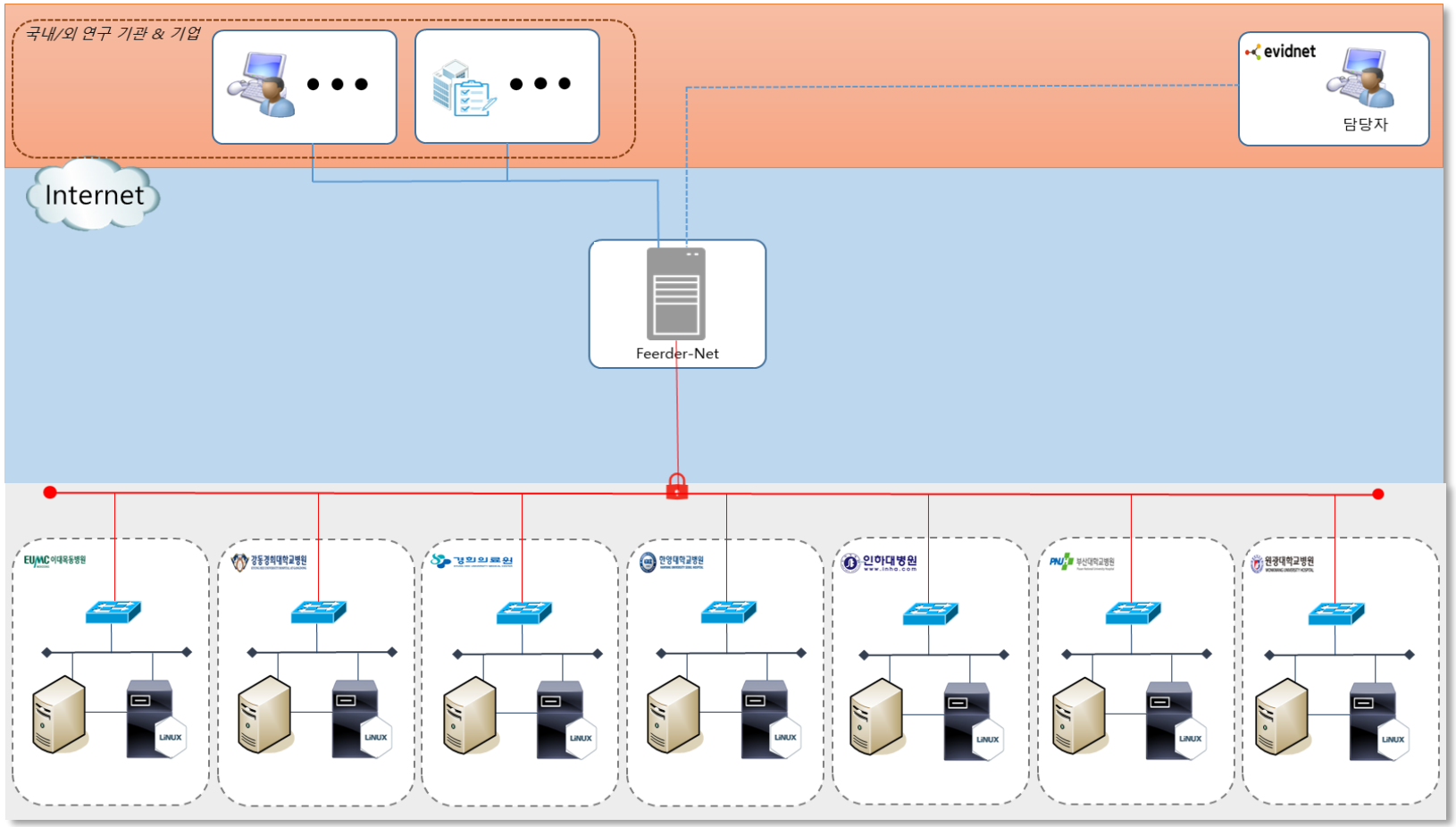
공통데이터 모델 기반

분산형 데이터망 을 이용한 실시간 감염병 관리시스템 구축 (제안)

FEEDER-NET 플랫폼 구축

병원 내 분석환경 구축 및 FeederNet 노드 연동

- 분석환경 구축 수: 28기관
  누적 FeederNet 연동 기관 수 : 19기관



CDM 데이터망 구축 현황

CDM 변환 병원 목록

No.	병원 명	병원 구분	변환 환자 수
1	가톨릭대학교 성모병원	3차	3,223,259
2	강동경희대학교병원	2차	822,183
3	강동성심병원	2차	1,662,083
4	강원대학교병원	2차	510,000
5	경북대학교병원	3차	1,002,381
6	경희의료원	3차	2,101,456
7	고려대학교 안암병원	3차	1,856,484
8	고려대학교 안산병원	3차	1,465,833
9	고려대학교 구로병원	3차	2,077,344
10	국민건강보험공단 일산병원	2차	1,358,280
11	대구가톨릭대학교병원	3차	1,688,980
12	동국대학교 일산병원	2차	779,474
13	메디플렉스 세종인천병원	2차	946,000
14	부산대학교병원	3차	1,753,002
15	분당서울대학교병원	3차	1,734,565
16	분당차병원	2차	2,363,386
17	서울대학교병원	3차	3,068,874
18	세종부천병원	2차	946,000
19	아주대학교병원	3차	2,400,000
20	연세원주세브란스병원	2차	-
21	원광대학교병원	3차	1,001,797
22	이화여자대학교 목동병원	2차	1,745,549
23	인하대학교병원	3차	1,977,256
24	전남대학교병원	3차	2,168,701
25	전북대학교병원	3차	1,433,023
26	칠곡경북대학교병원	3차	1,002,381
27	한양대학교병원	3차	1,783,111
28	화순전남대학교병원	3차	1,725,462

현 누적 변환 기관 수 : **28병원**
(3차: 17개 / 2차: 8개)
현 누적 변환 환자 수 : 44,596,864명

향후 CDM 변환 계획			
2020년	2021년	2022년	총계
11개 병원	5개 병원	4개 병원	23개 병원
2022년까지 **총 45개 병원** CDM 변환 예정			

FEEDER-NET 플랫폼 구축

한국산업기술평가관리원 Korea Evaluation Institute of Industrial Technology | 아주대학교의료원 Ajou University Medical Center | 산업통상자원부

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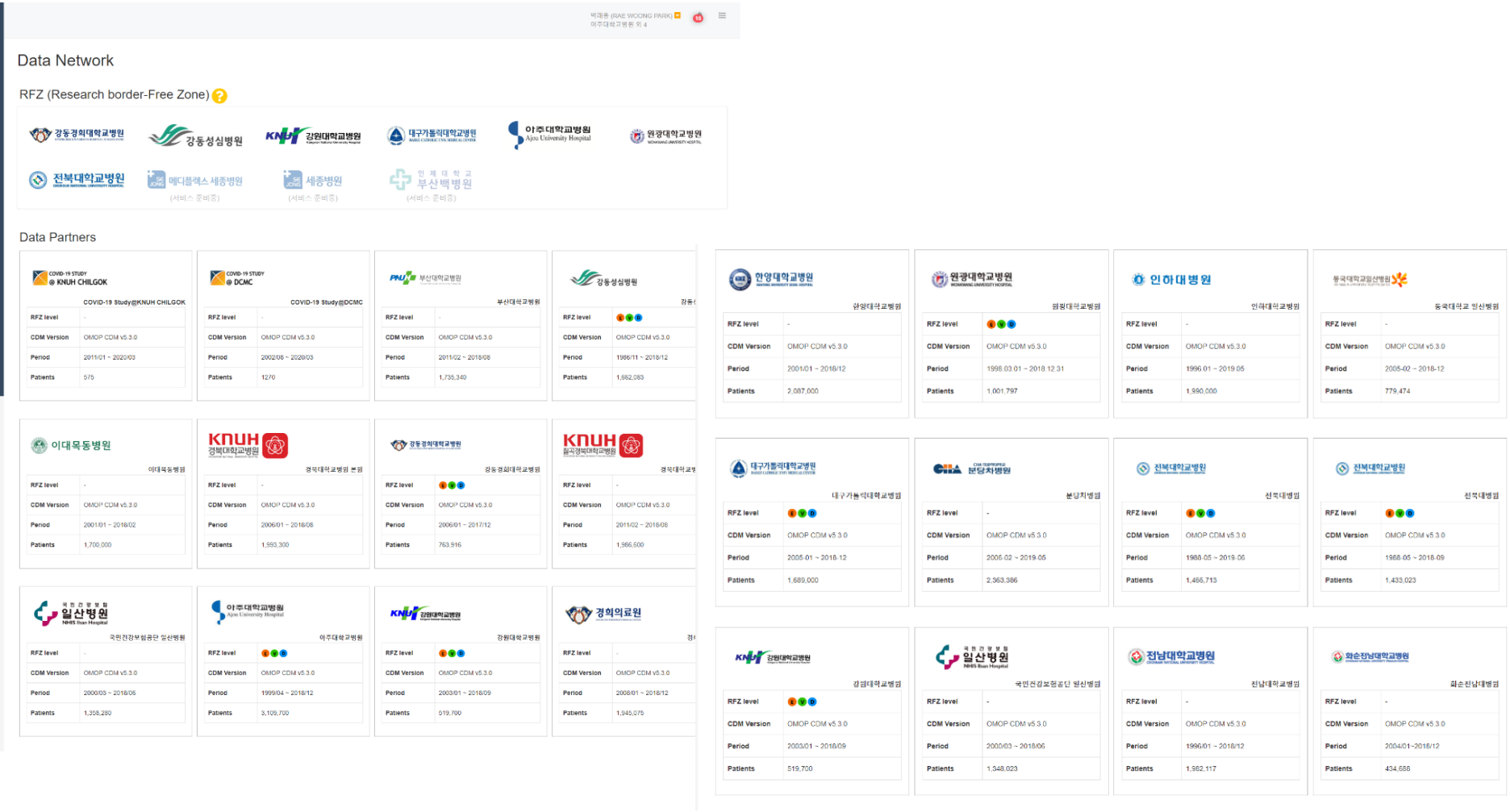


피더넷 참여기관 데이터 대쉬보드

ChosunBiz

'헬스 빅데이터 연구 자유지대'...아주대병원·세종병원 등 6개 기관 MOU

조선비즈 장윤서 기자

입력 2019.12.13 10:15 | 수정 2019.12.13 10:18

아주대병원, 분산형 바이오헬스 빅데이터 사업단, 강원대병원, 세종병원·메디플렉스 세종병원, 원광대병원, 전북대병원 총 6개 기관 협약

연구자유지대

- 원내 연구자에게 허용하는 동등한 수준의 CDM 연구권한을 연구자유지대에 참여하는 다른 기관 연구원에게도 동일하게 부여

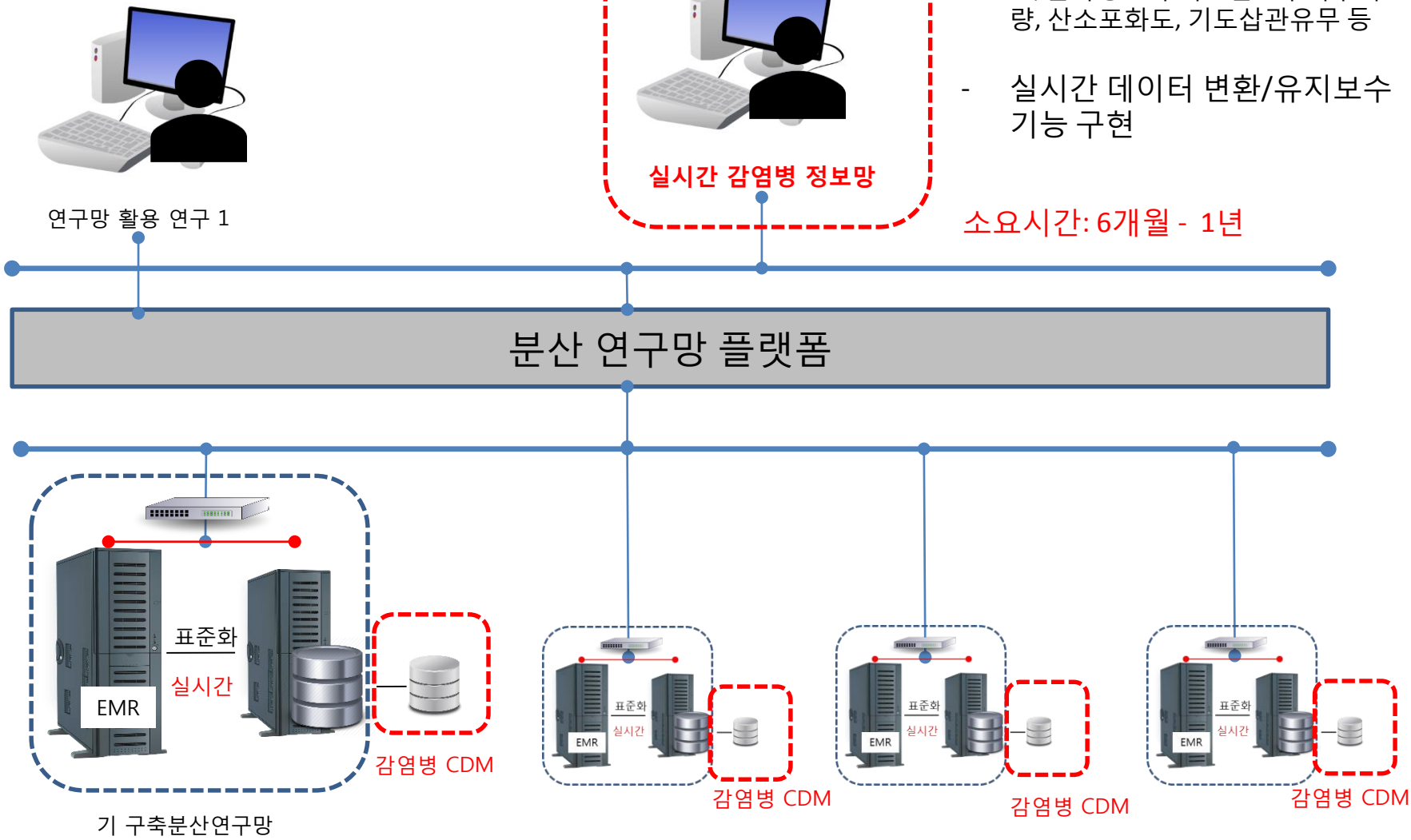
- IRB 승인·심의 면제가 필요한 경우, 주 연구책임자가 본인 소속 기관에서 IRB 승인·심의 면제를 득하였다면 협약기관은 이를 인정

기존 CDM분산연구망 활용『실시간 감염병 정보망』구축 제안

기존 분산연구망을 최대한 활용
분산플랫폼
각 병원에 설치된 H/W, S/W 인프라 활용

감염병 전용 CDM DB 추가 구축
- 기존 CDM에 포함되지 않은 역학 정보/환자정보 추가 – 산소투여투여량, 산소포화도, 기도삽관유무 등
- 실시간 데이터 변환/유지보수 기능 구현

소요시간: 6개월 - 1년



『실시간 감염병 정보망』구축 제안

- 실시간 CDM 변환시스템 구축
  - 기술적으로는 실시간 CDM변환 기술 이미 완성
    - 6월부터 아주대 적용
  - 병원의 우려
    - 실시간 연동시 병원정보시스템에 부하발생 가능성

- 감염병/재난 전용 CDM기반 정보시스템 구축:
  - 기존 분석시스템은 추가 개발 없이도 CDM변환 즉시 사용가능
  - 개발 기간: 단계별로 6개월 - 1년 소요
    - DB 모델 개발 (6개월 소요)
    - 관리시스템 개발 (1년 소요)
    - 분석시스템 구축 (1년 소요)

End of Document